$^{12}C(^{7}Li,d)$ 2008Cr03

1971Sc21: The reactions $^{12}C(^{7}Li,d)$ and $^{13}C(^{7}Li,t)$ were studied at E_{cm}=13.3 MeV using the lithium beam, from the EN-tandem-van-de-Graaff-Accelerator of the Max-Planck-Institut ftir Kernphysik at Heidelberg, impinged on a ^{13}C target (50% ^{13}C, 50% ^{12}C and ^{16}O). The reactions products were identified by the ΔE-E information. The overall resolutions for deutrons was about 90 keV.

The integrated cross sections σ_{int} were measured in both reactions. Spin assignments were extracted from σ_{int} in the reaction $^{12}C(^{7}li,d)$ and a modified DWBA code was used to analyze the reaction $^{13}C(^{7}Li,t)$. Energy levels and J^{π} values of ^{17}O were deduced.

1982Ta23: $^{12}C(^{7}Li,d)$, E=36,32,28 MeV; measured yield vs particle energy, $\sigma(\theta)$, fusion σ, breakup σ vs E; deduced reaction mechanism. Optical, simple breakup model analyses.

2008Cr03: XUNDL dataset compiled by McMaster, 2008.

E=34 MeV beam provided by FN tandem acclerator at Florida State. Detected charged particles using two ΔE-E Si telescopes. Measured absolute cross sections and $\sigma(\theta)$. DWBA analysis assuming a ^{5}He cluster transfer. FWHM=110 keV.

Theory:

1987Ar13: $^{12}C(^{7}Li,d)$, E(cm)=7.4,9.4 MeV; calculated (np), d emission σ, residual production σ(E) ratio. Hauser-Feshbach theory.

^{17}O Levels

E(level)‡	J^{π}‡	Γ†	L‡	C^2S‡#	Comments
0@	$5/2^+$				E(level),J^{π}: See also (1971Sc21).
870@	$1/2^+$				E(level),J^{π}: See also (1971Sc21).
3060@	$1/2^-$				E(level),J^{π}: See also (1971Sc21).
3840@	$5/2^-$				E(level),J^{π}: See also (1971Sc21).
4550@	$3/2^-$				E(level),J^{π}: See also (1971Sc21).
5080					E(level): from (1971Sc21).
5220@	$9/2^-$				J^{π}: 7/2 (1971Sc21).
5380@	$3/2^-$				
5700@&					E(level): See also doublet 5.69-MeV and 5.72-MeV (1971Sc21).
5900@&					E(level): See also doublet 5.87-MeV:J^{π}=5/2 and 5.94-MeV:J^{π}=1/2 (1971Sc21).
6360@	$1/2^+$				
6860 *13*	$5/2^+$		3	0.53	Configuration=$^{12}C_{g.s.}+1p^2_{1/2},1d^3_{5/2}$-(3p-2h). E(level): See also 6.87-MeV:J^{π}=7/2 (1971Sc21).
6990	5/2				E(level),J^{π}: from (1971Sc21).
7170@	$5/2^-$				E(level),J^{π}: See also (1971Sc21).
7380@&	9/2				J^{π}: from (1971Sc21).
7580 *13*	$7/2^+$		5	0.59	Configuration=$^{12}C_{g.s.}+1p^2_{1/2},1d^3_{5/2}$-(3p-2h). E(level): See also 7.56-MeV:J^{π}=9/2 (1971Sc21).
7760@	$11/2^-$				E(level): See also triplet 7.69-MeV:J^{π}=3/2, 7.71-MeV:J^{π}=7/2 and 7.72-MeV:J^{π}=3/2 (1971Sc21).
8470 *13*	$9/2^+$		3	1.06	Configuration=$^{12}C_{g.s.}+1p^2_{1/2},1d^3_{5/2}$-(3p-2h). E(level): See also triplet 8.40-MeV:J^{π}=5/2, 8.47-MeV:J^{π}=9/2 and 8.50-MeV:J^{π}=5/2 (1971Sc21).
8680@	$3/2^-$				
8900@					E(level): triplet. See also triplet 8.87-MeV:J^{π}=3/2, 8.88-MeV:J^{π}=7/2 and 8.95-MeV:J^{π}=7/2 (1971Sc21).
9190@					E(level): quadruplet. E(level): See also (1971Sc21).
9490@	$5/2^-$				E(level): See also (1971Sc21).
9710@	$7/2^+$				E(level): See also (1971Sc21).
9870@&					E(level): See also doublet 9.88-MeV and 9.95-MeV (1971Sc21).
10690 *26*		<40 keV			E(level): See also 10.78-MeV (1971Sc21).

Continued on next page (footnotes at end of table)

^{12}C(^{7}Li,d) 2008Cr03 (continued)

^{17}O Levels (continued)

E(level)‡	Jπ‡	Γ†	L‡	C^{2}S‡#	Comments
11040@					
11240@					
11820 *13*	7/2$^+$		5	0.96	Configuration=$^{12}C_{g.s.}+1p^{0}_{1/2},1d^{5}_{5/2}$-(5p-4h). E(level): See also 11.88-MeV (1971Sc21).
12000 *26*	9/2$^+$	<50 keV	3	0.56	Configuration=$^{12}C_{g.s.}+1p^{0}_{1/2},1d^{5}_{5/2}$-(5p-4h).
12220 *26*	7/2$^-$		2	2.16	Configuration=$^{12}C_{g.s.}+1p^{1}_{1/2},1d^{2}_{5/2}$-(2p-1h).
12420 *26*	9/2$^+$	<50 keV	5	0.77	Configuration=$^{12}C_{g.s.}+1p^{0}_{1/2},1d^{5}_{5/2}$-(5p-4h).
12760 *26*		<70 keV			Γ: Estimated value based on the FWHM of the peak in the ^{12}C(^{7}Li,d) reaction (2008Cr03).
13060 *26*					
13580 *26*					
14550 *26*					
14720 *26*					
14880 *26*					
15070 *26*					
15620 *26*					
15800 *26*					

† From (1986Sm10) except where noted. Width measurement limited by detector resolution of the ^{12}C(^{6}Li,p) measurement (2008Cr03).

‡ From (2008Cr03) except where noted. Some concern is raised over the small number of nodes used in the DWBA analysis for some cases (priv. comm. J. Millener).

Assuming ^{5}He cluster, assumed configurations are listed.

@ From Fig. 1 of (2008Cr03).

& Doublet.